Including plant health in the 'one health' concept

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15. Including plant health in the 'one health' concept – in theory and in Uganda

BY SOLVEIG DANIELSEN

The 'one health' concept has largely been defined around zoonotic diseases and the sharing of infrastructure and capacities of human and animal health systems. Veterinary public health is an essential part of public health and includes various types of co-operation between the sectors and disciplines that link the health triad, people-animals-environment.

Yet agriculture is missing in the equation. Many human and animal health problems are caused or worsened by hunger, malnutrition and poor quality of food and feed. Looking beyond the zoonoses, it is clear that human and animal health are closely connected to plant health for at least four reasons: *Food security* – enough food at the right time to feed people; *Food safety* – plant products free from mycotoxins, pesticide residues and human disease contaminants; *Feed security* – enough feed at the right time to feed animals; and *Livelihoods* – agriculture is the world's most important enterprise and is fundamental for economic growth in developing countries. Agriculture means crops. Plant health is essential if the crop yields are to be sufficient and of the right quality.

Health systems for plants

Unlike in human and animal health, where delivery of health services is regarded as central, the world of plant health tends to focus more on specific crops, pests and technologies than on delivery systems for 'plant healthcare'. In 2003, to make up for the apparent gaps in plant health service delivery, the Global Plant Clinic of CABI (a not-for-profit science-based development and information organisation) started to experiment with community-based plant clinics in Bolivia as a way to improve plant health services for farmers. Bangladesh, Uganda and Nicaragua followed in 2005.

Soon after plant clinics were initiated in Nicaragua, a network of national organisations working in plant health made further improvements. Enabled by support from Danida's Agricultural Sector Programme as the overall 'umbrella', a formal system, though very incipient, was set up to support the plant clinics and connect them with diagnostic laboratories, regulatory bodies, agro-input supply and research institutions. The 'plant health system' concept was born.

A broadened 'one health' concept

The emergence of the 'plant health system' approach paved the way for discussions within DBL on expanding the 'one health' concept to include plant health. The plant clinics had shown their worth, not only in improving plant health services to farmers, but also in promoting joint plant-animal service delivery. In Nicaragua and Bangladesh some plant clinics started to give advice on animal health as well in response to the farmers' demands. For many extension workers this combination is straightforward, since they already give advice on a range of topics concerning agriculture and livestock.

Figure 1 illustrates how joint service delivery and cross-sectoral learning (blue lines) are envisaged to interact and deliver plant, animal and human health outcomes (green lines).

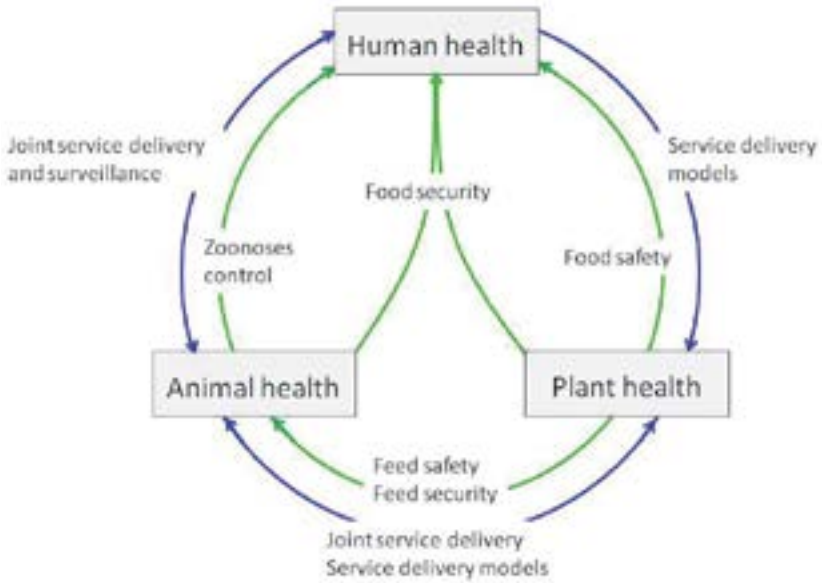

Figure 1. A broadened 'one health' concept. The arrows indicate contribution pathways; the green lines represent outcomes and the blue lines represent service delivery models and mechanisms.

The broadened 'one health' concept model is based on a number of assumptions about interactions and contributions that remain to be tested. Human and animal health systems have been subject to decades of research, so a lot is known about determinants of health, service delivery and health system design and performance. All this is pretty new in plant health.

From concept to reality

Uganda was the first country where plant health system research was to be carried out. It seemed to be the right place to start this new field of study, as Uganda had

been experimenting with plant clinics since 2006 and recently included plant clinics in government policy to improve farmer services and disease surveillance. Danida funded a two-year research project, "Plant health systems in Uganda – A novel approach to plant healthcare", which was carried out in 2010 and 2011 in collaboration between DBL, Makerere University, Uganda, and CABI.

There were basically two things we wanted to do. First, to develop a useful framework to analyse the performance of plant clinics, and second, to find out what 'system factors' influence clinic performance.

As point of departure we used the health system framework of the World Health Organization (WHO), which is based on six building blocks and illustrates how health outcomes are delivered. We assumed that the basic building blocks would be the same for plant health systems, though with small adjustments. We modified the framework to fit the purpose of measuring clinic performance (Figure 2). Two of the performance indicators, coverage and quality of (plant) healthcare, were derived directly from human health, while the third indicator, regularity/timeliness, was used as a proxy for access, another performance indicator commonly used in human health. This seemed to be a reasonable choice, since early field observations had indicated a correlation between the two.

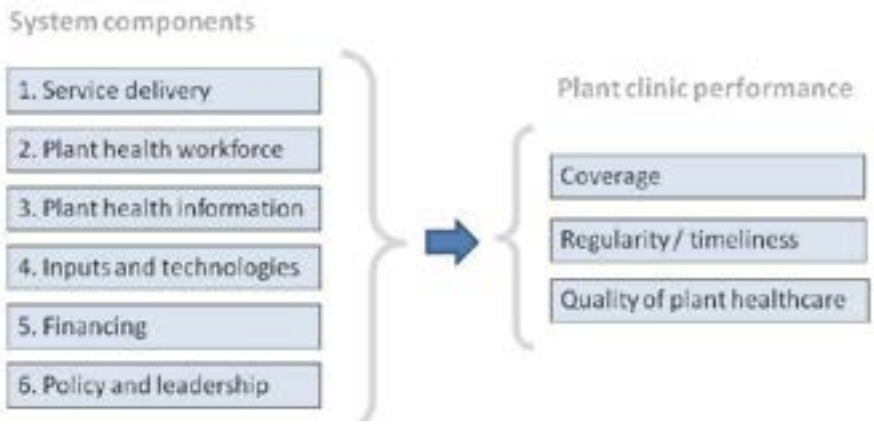

Figure 2. Plant health system analytical framework (modified from WHO, 2007).

Delivering plant healthcare

The plant health system approach draws heavily on principles from human healthcare, using plant clinics as primary healthcare providers to local farmers. These clinics are simple plant health facilities operated by 'plant doctors' and assisted by 'plant nurses' or 'nursing aids'. In most cases, the plant doctors are local extension workers from either government extensions or non-governmental organisations (NGOs).

Most plant clinics in Uganda are set up to operate once every two weeks from a public venue, typically a market-place. The clinics are mobile facilities with tables and

chairs, a banner, a clinic record, a prescription pad, photo sheets and fact sheets, some pamphlets on specific diseases and sometimes fresh samples of diseased plants. Some plant clinics have a small display or outlet of agro-inputs, such as seeds and pesticides. If there is a budget for it, the event is publicised in advance, for example by radio.

Farmers are invited to bring in sick plant samples and ask about any plant health problem. If possible, they receive a diagnosis and a written recommendation on what to do (Figure 3). In case the plant doctor cannot identify the problem, ideally he or she refers the sample to a diagnostic laboratory or in some other way consults an expert.

Figure 3. Primary healthcare for plants. The Soroti Catholic Diocese Integrated Development Organisation (SOCADIDO), a local NGO, runs the plant clinic at Katine market (Soroti, Uganda). The client is first registered by a nursing aid, then the plant doctor attends her.

Promising results

During the project period, plant clinics expanded to 13 districts, and more districts began to show an interest in joining the initiative. Many agreed that the plant clinics could do things that no other extension method could. The systematic collection of farmer demand and information about the pest status in the field was unique. The plant clinics also proved that they were able to cover a large geographic area, thus expanding the reach of existing extension services (Figure 4).

The plant clinics received queries from more than 2,000 clients from over 800 villages during the study period. More than 50 crops with dozens of problems were attended to. Cassava brown streak disease, banana bacterial wilt, groundnut rosette, orange leaf miner and a fungal disease in orange were the most commonly recorded diseases. These are all diseases that pose a serious threat to the food security and livelihoods of Ugandan smallholders.

Momentum for change

The plant clinics were seen as a new and promising way to provide timely advisory services to farmers who had been left in the hands of destiny to cope with rampant plant diseases. There was a growing commitment among implementers and policymakers to expand and consolidate these services. The focus slowly shifted towards viewing the clinics as part of a wider 'plant health system', where plant clinics, diagnostic laboratories, disease surveillance, research and input supply were better connected than had hitherto been the case.

The ministry allocated funds to train more plant doctors and provide technical support and supervision to the plant clinics. And Makerere University established a plant health systems committee to coordinate training and diagnostic support.

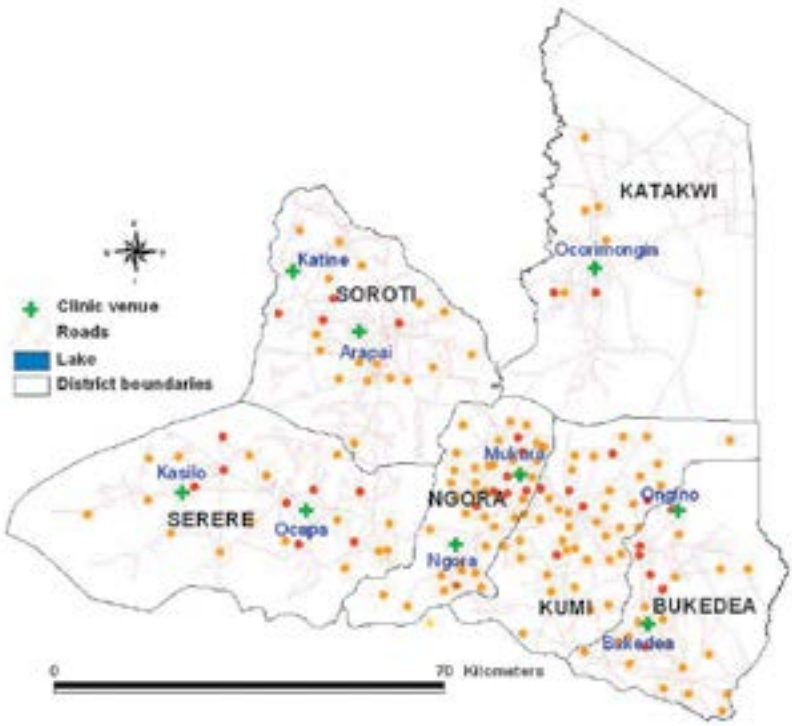

Figure 4. Coverage. Plant clinic catchment areas for nine plant clinics in the Teso region. Each dot represents a parish (total: 190 parishes). Half of the clinic users came from the parishes marked with red dots.Remaining challenges

It was nonetheless evident that the plant clinic initiative expanded in a loose and unregulated way. It was not always clear who was leading the activities and providing the overall leadership needed to guarantee that basic standards and procedures were in place and followed up. Many of the observed clinic weaknesses were products of missing co-ordination, follow-ups and communication.

Although the plant clinics had become part of government policy and the districts showed increasing interest, there were some structural barriers that made it difficult for the districts to institutionalise the plant clinics and for the ministry to play its leading role.

There was a mismatch between institutional mandates and allocated resources. The ministry and local governments have the legal mandate, but few resources, to regulate pests and diseases. On the other hand, the government extension services were designed to address specific commodities chosen by the farmers, not plant health at large. The plant clinics were 'orphans' within the system.

Plant clinic performance during the project period was also affected by a protracted phase of uncertainty about their future. Local government activities in general were heavily constrained by a district reform, electoral campaigns and the prolonged initiation of the second phase of the national agricultural advisory services programme. Staff scarcity, work overload, unplanned activities and inadequate funds for clinic operations also limited plant clinic execution.

The future of the Ugandan plant health system

The agricultural policies in Uganda support plant clinics and this is a major step forward. However, the existing governance structures, institutional mandates and resources make it difficult to institutionalise the mixed-mandated clinics. Finding a solid institutional base for the 'orphaned' clinics will be a major challenge.

The health system framework

We found that many factors influenced the performance of plant health clinics in Uganda, from practical, everyday concerns of clinic staff to the policy framework that shapes public sector activities and relationships with the NGOs and private sectors.

Using a plant health system framework derived from human health to analyse events enabled us to organise the issues and identify key features that affect plant clinics and their surroundings. The initial results were encouraging since the framework gave a structure for analysing human behaviour and outcomes and for identifying what interventions are needed to improve performance.

The preliminary results helped us to understand what works and why. In general, we found a good correlation between plant health system attributes and clinic performance, which will help guide future research.

Visions for the 'one health' concept

The project was anchored in the vision of a broadened 'one health' concept that includes animal, human and plant health. The vision is still viable, but its translation into reality remains a challenging process. Disciplines need to work together and learn from each other. And as shown in this study, the systems approach allows disciplines to create a common starting point for a much-needed joint process towards improved living conditions.

Food safety, food security and animal and human health are inter-dependent. Why not address related challenges from a shared system perspective? Why do we need parallel systems if they basically build on identical core elements? There are lots of synergies to be harvested and lessons to be learned across sectors. We know that it will not be easy. But with continuous reflections and emergence of evidence the vision will stay alive.